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THE LEGEND OF BLOOD POOL

By Major A. F. MOCKLER-FERRYMAN.

HIGH up on the fjelds, under the shadow of the great domed snow-field known as the Jökul, stretches a weird, wild plateau strewn with mighty granite boulders, and seamed with countless rivulets draining off the snow-waters into a network of long, deep lakes. No one lives on this waste except for a few weeks of the short summer and autumn, when, if you wander up from the lowlands to the outlying saters, you will find that half the peasants are away with their cattle, grazing them on the rich vegetation that crops up amongst the rocks or that fringes the borders of the tarns. Or, maybe, if you ascend to the plateau itself—four thousand feet above the sea—you will meet with solitary reindeer-hunters living in small stone shelters, and spending their time in netting the trout and stalking the deer. Occasionally, also, you may come on a herd of tame reindeer, watched over by wrinkled-faced Lapps, who roam throughout the highland pastures whithersoever their deer may choose to lead them.

The story I am about to tell was given to me by one of these wandering Lapps—Black Andreas—who, according to his own account, has weathered ninety winters, and whose puckered face has the appearance of having withstood the elements for several centuries. The old man is not garrulous; his tongue, in fact, can only be loosened by the application of raw spirits; and as he drinks and talks only at night, lapsing into a comatose state after about half-an-hour, it can be understood that the extraction of his story was a matter of considerable time. To reproduce it in his own words at all literally translated would be an utter impossibility; all I can hope to do is to relate the tale from memory, with the aid of a few rough notes that I took from time to time. Whether the whole thing is mere romance produced from a brain fired by ardent potations, or whether it is founded on fact, I am not prepared to say, though it is well known among the seter-

folk of the neighbourhood, and many an old Norseman can throw light on several points.

It all happened when Svarte Andreas was a young man, and he himself speaks with a knowledge of facts and as one who actually knew the actors in the tragedy—for such, we shall see, it was. The scene lies in one of those small, sheltered valleys stretching down from the Jökul towards the east, where for eight months of the year the wonders of the land lie buried deep in snow. In the summer, however, it is fair enough to look upon; true, there are no trees, but a wealth of glorious scenery extends in all directions. If you look to the west you see the solid white sloping sides of the snowfield, which resemble for all the world the sugar surmounting a bridal cake—poured carelessly on the top and allowed to run over in parts. Turn in whichever other direction you will, the same scene meets your gaze—a vast stony waste, with here and there a black, rounded mountain-top standing up above the general level of the plateau, and a score of sparkling lakes, each in its setting of green-sward and marsh; while everywhere between the rocks stand banks of gray reindeer-moss and tufts of coarse grass, studded with brilliant-flowered alpine plants. It is a sight worth seeing in the early summer months, and the unspeakable solitude of the spot makes you feel that you are a trespasser in Nature's preserves. The stone-chats flit from rock to rock, uttering their cries of alarm; the golden plover calls plaintively to his mate, and the lemmings dart into their holes at the first sight of the intruder. At your feet, as you stand in this little valley, lies a deep, black tarn, surrounded by a morass of soft, peaty earth, where grow in wild luxuriance, between the bunches of white cotton-grass, the delicious multiberries—the yellow fruit like little balls of gold among their russet leaves. The tarn is known as Blood Pool; and thereby hangs the tale.

It was autumn; the harvest in the lowlands was over, and the farmers' sons were free to go to the

mountains and try their luck with the wild reindeer which, in the early years of the present century, roamed in vast herds over the Hardanger Vidde. Englishmen were as yet almost unknown in the land, and, indeed, the Englishman who figures in this story was said to have been the first that ever attempted deer-stalking in these parts. He was looked on as an eccentric individual; for, that any one of means should live in a *fiskebod* in the wilderness and shoot reindeer without wanting the flesh of the animals was to the Norseman a thing unheard of. The real name of this adventurous sportsman has unfortunately become unintelligible, for Veelpal (as Andreas calls him) can be converted into no English equivalent; yet possibly, when my story is read, some one may remember to have heard a similar tale of one of his relatives, and so be able to set the matter at rest for ever, and give to the sæter-folk the interpretation of Veelpal—the mad Englishman. Be that as it may, the shooting season had come, and for the second time the Englishman had taken up his headquarters in a small hut by the side of Tin-hölen Lake, whence, at sunrise each morning, he started, with his musket, in search of deer. The results of his first season had gained him a great reputation among the local hunters, and 'to shoot with English bullets' had become almost a proverb; yet he had been now a fortnight on the Vidde without doing any execution whatever. The cause of his bad luck he put down to the wind, which had kept in one quarter for several days, and thus attracted all the deer to one part of the vast plateau.

'This accursed lake again,' muttered the Englishman, who, after a hard day's toil in pursuit of a wounded buck, found himself on the sodden margin of what is now called Blood Pool, in the swamps of which the tracks of the beast had suddenly disappeared. Twice he beat round the edge of the morass, but not a footprint could he discern beyond a certain spot; then, having refreshed himself with multiberries to his heart's content, he abandoned the chase, and strolled up to a neighbouring ridge in order to scan the country. He was now several miles from his hut; the sun had long since ceased to tinge the Jökul with its expiring rays, and a heavy mist was creeping up the valleys. Suddenly, as he gazed northwards, he descried a thin wreath of smoke ascending from a mound by the side of a tarn at no great distance, and thither he at once decided to wend his way in search of a night's lodging. The mist had enveloped the country rapidly; and as the weary Englishman approached the spot where he had noticed the smoke, it became impossible to see ten yards ahead, and to right and left he wandered without discovering anything in the nature of a hut. The place, moreover, had grown uncanny; strange sounds issued from the depths of the mist, and even the great gray boulders appeared to be moving. Many a time had Veelpal

laughed at the old women's tales related by the sæter fire, of the trolls and the evil spirits that dwelt among the mountains; but now it seemed as if he were suddenly confronted by every species of ghost and goblin. He sat down and rubbed his eyes, thinking that, tired out and hungry, he must be suffering from a disordered brain. A great snowy owl swooped silently by him out of the gloom—a new terror; but, nerving himself, he arose and shouted at the top of his voice. The effect was magical; the large stones around him got up and fled out of sight, and, almost at his elbow, a small rasping voice asked in bad Norsk, 'Who is it calling?' The voice had issued from the mound, and Veelpal at once remembered that there was a particular kind of spirit that lived in mounds on the fjelds; but, on turning, he found that his questioner was a reality—a little old Lapp, whose head and shoulders were protruding from a trap-door in the side of the hillock on which he had been seated.

'Welcome to the palace of the King of the Lapps,' said the old man, with a certain amount of dignity; 'it is not often that we have visitors here, and I have never seen a foreigner in these regions before. I suppose you are none other than the mad Englishman who shoots the deer for amusement?'

Veelpal nodded, whereupon the Lapp rubbed his hands together, broke into a succession of chuckles, and then laughed until the tears ran down his cheeks.

'How many deer have you lost in the pool up yonder?' he asked.

'Which pool?' inquired the Englishman.

'Why, the pool away over the brow, where the water lies deep and black, and whither the hunted deer flee for shelter—shelter which they get, too,' chuckled the Lapp.

Veelpal became interested, for on several occasions he had had the same bad luck that had pursued him this day; he had followed the deer as they fled towards the snowfield, and then had suddenly lost all trace of them. His host, however, refused to enlighten him as to the disappearance of the animals, only nodding his head and smiling to himself when questioned. Then, getting up from his seat, he took down from a niche in the wall a number of small and well-polished bones, which he threw in a heap on the floor. These he gazed on for a while; then, gathering them up, he remarked, with a smile, 'There'll be more deer to disappear on the morrow, and Ravdna comes home. Ravdna is my granddaughter, and I had to send her this morning up into Sysendal to fetch back some of the herd that had strayed.'

It began to dawn on the Englishman that the Lapp was the owner of tame reindeer; and when the old man presently got up and said that he must go out and see to his animals, the mystery of the moving rocks that had troubled the sports-

man was now cleared up. He required no second invitation to take possession of the absent Ravdna's bed, and by the time his host returned he was fast asleep.

The sun had already been some time above the horizon when the old Lapp gently shook his guest, and bade him get up and partake of the coffee which he had prepared. Then, for the first time, the Englishman was able to see by the light streaming in through the open trap-door the interior of the 'palace of the king.' There was but one room—some ten feet square—lined throughout with stones and rough planks, and blackened by the smoke from the peat and juniper fire that burned in one corner. A few wooden shelves were ranged round the chamber, and pieces of reindeer horn stuck in between the stones served as pegs, on which were hung innumerable articles of wearing apparel, fishing-nets, cooking utensils, and odds and ends; while two rough wooden couches stood in opposite corners—the beds of Ravdna and her grandfather. There was nothing peculiar about the hut; it was very similar to many another *fjeldbod*; but from the centre of the dingy roof was suspended an object which at once attracted the Englishman's eye. This was a massive bowl of bright metal resembling beaten gold, and it hung by three chains of the same material. Round the rim was chased a Runic inscription, and the remainder of the vessel was engraved with quaint hieroglyphics. To a connoisseur of works of art, as was Veelpal, the bowl became a matter of the deepest interest; and, being a man of few words, he forthwith inquired of his host if he would part with it.

'Not for all the wealth that the earth has yielded up to man, nor for all the wealth that is still locked up in the bowels of earth, would I allow that bowl to leave my family,' was the curt reply. 'But,' added the Lapp, 'when I am called to join my forefathers in Valhalla, the bowl will pass to the man who weds Ravdna—the last of our race. As for you, forget that you have ever seen it, and if you desire peace in this world, pray to your God that you may never see into it.'

The Englishman would have asked further questions, but the arrival of Ravdna put an end to the conversation. With a wild whoop, she burst through the narrow doorway, when, suddenly discovering that her grandfather was not alone, she drew back, then, with flushed face, held out her hand to the stranger, and in a soft, melodious voice, said, 'Velkom til Finsebu.' Veelpal stood spell-bound; never before in Norway had he met with such an apparition, and his astonishment was the greater because he had imagined that the girl would be of the unkempt *sæterjante* type usually encountered in these parts—instead of which, there stood before him a form whose portrait truly depicted would have made a painter's fortune. A dark-green dress trimmed with red braid, and a

crimson bodice laced with silver, covered her shapely figure; while a white shirt and a solid silver waist-girdle made up a costume at once neat and picturesque. Far below her waist hung two thick plaits of flaxen hair, and the flowered silk handkerchief used as a head-covering had fallen loose round her neck. On her feet were sandals of reindeer-skin, and a cloak of the same trimmed with lemmings' skins depended from one shoulder—the picture of this northern Diana being completed by a slung bow and quiver, and a short spear carried in the hand. There was nothing in the girl's face to bespeak a life of hardship and toil, as undoubtedly hers was, for her features were delicately modelled; and, though her face was sunburnt, her complexion was fair, even for a Norsewoman. It was all a revelation to the Englishman—a peep into an age long past; and it was with undisguised reluctance that, when the old Lapp hinted broadly that it was time for him to depart, he said 'farvel' to his new acquaintances.

'Welcome back again,' laughed Ravdna, in the most unconventional manner, holding out her hand, and, at the same time, piercing the stranger through and through with her pale-blue eyes.

It was a good fifteen miles from Finsebu to Tinhölen, and twice the distance it seemed today to the sportsman, who for once had no thoughts for the reindeer, no thoughts for anything but Ravdna—the princess of the Vidde. His boots, as they crushed the dried-up moss; his musket, as it jogged against his back; every trickling stream he passed, and every bird that chirped from tussock to tussock, uttered the same word—Ravdna. Twenty-four hours before he would have scorned to think that he would ever have crossed from ridge to ridge of this wild country without scanning every inch of it with his telescope in search of reindeer; yet here he was—he, the professed misogynist—the man who cared for nothing but the chase—plodding aimlessly along, with eyes on the ground and with thoughts for nothing but a Lapp girl.

Life for the Englishman was now a mere miserable existence; his hut, which before had been all that was desirable in his eyes, had become a wretched hovel; his weapons were put in a corner, and for the time being forgotten. To make matters worse, the two days following his adventure were wet, when it would, at any time, have been useless looking for reindeer; but the third day broke clear and bright, and Veelpal was early abroad. With his musket on his back, he walked without any apparent object, though at noon, by some strange fate, he found himself once again by the side of Blood Pool. Why he had come to the spot he would not have confessed even to himself. On starting at daybreak he had intended going in the opposite direction, yet, gradually some mysterious power had drawn him towards Finsebu; and here he stood gazing into the deep

black water, until suddenly a laugh behind him caused him to look round, when he descried Ravdna seated on a rock and waving her hand to him.

'Well, so you have come back again,' shouted Ravdna, standing up and making him a mock curtsy; 'but you have not sent us any deer to-day.'

'Sent you deer! How can I send you deer?'

'Why, don't you know that when the wind blows from the right direction every deer within miles comes up towards the Jökul? This narrow path is the only one hereabouts by which they can cross the swamps and lakes.'

Leading her companion down a little farther, she showed him how her grandfather benefited by the flight of the deer along the path. The track led by the edge of the pool, and between it and a far-extending swamp; at a certain point in the path Ravdna stopped, and, pointing to some layers of juniper twigs, exclaimed, 'Now I will show you what becomes of the deer when they take this path.' She stooped down, and, lifting a mass of branches, disclosed to the astonished Englishman a carefully concealed pitfall, some twenty feet deep, and lined throughout with stones. 'That is how we catch the wild reindeer,' said Ravdna; 'and now you know how you send us deer.'

The Englishman was disgusted at the sight of what he considered a mean, poaching device; but Ravdna's society soon drove the matter from his mind, and the afternoon passed pleasantly enough in listening to the half-wild girl discoursing on the habits of the reindeer. Many a strange tale had she to relate; her short life seemed to have been spent in a vortex of excitement and adventure; she had had single-handed encounters with wolves—had even slain a bear with the short spear which she always carried; and the number of reindeer that she had assisted in doing to death in the fatal pitfall was to Veelpal horrible to hear recounted.

Yet, in spite of the barbaric delight which the girl displayed in her bloodthirstiness, her nature was not altogether devoid of tender feelings, as was evidenced by a trifling incident which occurred on the occasion of this meeting. As the couple wandered over the rough fjelds they came on what at first they imagined to be a wounded plover; shortly, however, they discovered that it was merely the mother's ruse to draw off attention from her offspring—two little, long-legged balls of down—which were running wildly first in one direction and then in the other. Ravdna's solicitude for the safety of the family brought out all her womanly instincts, and increased the Englishman's admiration a hundredfold, so much so that he could not refrain from remarking on her conduct.

'Did you but know my story,' replied the girl, 'you would no longer wonder; but I have sworn on the great golden bowl that, until my grandfather's death, I will reveal nothing.'

To Veelpal the walk towards the pool became a daily habit. Reindeer-shooting was forgotten;

a sight of Ravdna was all he lived for, and his goddess he saw each day. The neighbourhood of Finsebu had long since been abandoned as a trysting-place, for the reason that the King of the Lapps had forbidden his granddaughter to meet Veelpal, whom he now regarded with the most bitter animosity. Still, such difficulties gave only a keener zest to their meetings; and Ravdna's duty of watching the herd allowed her full opportunity of wandering far from home. Sheltered by the rocks of some time-worn moraine, the couple would sit together for hours at a time, Veelpal ever endeavouring to persuade his fascinating companion to give up her wild existence and take her place as wife and mistress in his English home; while Ravdna, deeply impressed by all her lover told her, begged only for time—till her grandfather died and set her free.

So the days passed, and summer had drifted into autumn. The first snow had fallen and driven the ryper towards the lower slopes of the fjelds, and the Englishman had decided to make his final appeal to Ravdna on the morrow; his stone hut was becoming uninhabitable, and the cold was no longer to be borne. The morrow came, and Veelpal was early at the place of meeting, but Ravdna was absent. For an hour he waited impatiently, then strode along the reindeer path towards Finsebu. On the margin of the pool he found the Lapp girl, seated with her head buried in her hands, and sobbing as if her heart would break.

'What is it, Ravdna?' he asked.

'He is dead,' she murmured, 'and I it was who brought his death.' Then, gasping between the sentences, she related the catastrophe that had come upon her: how her grandfather had been preparing the pitfall in the morning, and how she, while tending the herd to the southwards, had come on a large number of wild reindeer, and had driven them towards the pool. Onwards to the Jökul they had sped, with the result that the old Lapp king had been caught on the narrow path, and had been trampled to death by the terrified beasts.

'Come and see him,' concluded the weeping girl; and Veelpal followed her to the hut. The body was laid out on the bed, and had been covered with a richly-embroidered shawl. A curious golden crown, studded with jewels, was placed upon the head, a spear in one hand and a knife in the other; while on the floor by the bedside stood the great bowl—and, horrible as it seemed to Veelpal, filled with blood. Bidding him follow, Ravdna lifted the bowl carefully, and retraced her steps to the edge of the pool, when, turning to Veelpal, she told him to gaze into the blood and tell her what he saw. She shook as she held the bowl, and the Englishman, awed by the weird situation, obeyed the girl, and looked down into the red fluid. There he saw reflected the troubled face of Ravdna side by side with

his own, the slopes of the white snowfield, and the strange hieroglyphics chased on the bowl.

'Tell me exactly what you see,' said Ravdna; and he told her.

'Can you see no more than that?'

'No more.'

'It is because you are not of our people. You can see only the present; your sight helps you nothing in regard to the past or the future. I see many things in the bowl; do you hold it so that I may look the better.' Not liking to refuse, the Englishman reluctantly obeyed, and Ravdna bent down, and clasping her forehead with her hands, spoke as one in a dream:

'I, Ravdna, Princess of the Lapps, am looking into the past. My mother's face is before me—a fair face, the face of a Norse sæter girl. Why does she marry the Lapp king's son? She loves him. But he is cruel; he drives her from his hut to roam on the fjelds with her two little ones, and she and her small son are devoured by the wolves. Her people at the sæter swear to be revenged, and kill my father, hurling his body into the depths of yon pool, and I am saved and carried back to the sæter. In time my father's father comes and makes peace with my mother's people, and I am given into his care. I am looking now into the future. I see the face of Ravdna and the face of a man'—

Thus far had the fair sorceress proceeded, when the Englishman, trembling with excitement, let the bowl slip from his hands, and its contents, trickling down through the black earth, gradually crimsoned the waters of the pool.

'What have you done?' screamed Ravdna in agonised tones. 'Oh, see what you have done! The blood of the sacred white deer is mingling with the unhallowed waters. It is my father's curse.'

Then, stretching out her hands towards the towering Jökul, she murmured, 'O spirit of the great snow, have pity!' and, with a wild, piercing shriek, fell forward on her face. Veelpal lifted up the senseless form and conveyed it to the hut, placing it tenderly on the vacant couch. For hours he sat by her side, listening to her incoherent utterances, and endeavouring to make her understand the situation; but no sign of recognition did she give. She was living her young life over again, and at times her speech was quite unintelligible to the Englishman, though he gathered that she was cold and cheerless. He warmed up some reindeer milk and gave it to her, and he heaped up the juniper twigs on the fire. By sundown Ravdna had fallen into a deep sleep, her hand tightly locked in his, and Veelpal, tired and weary, sat thinking over the events of the day.

That night two reindeer-hunters, from their hut at Halne Vand, noticed a strange glare against the background of the Jökul. Next morning they met a Lapp herdsman, who had seen the same light, and who told them that the herds of the Lapp king were scattered far and wide over the fjelds. Together the three men proceeded to Finsebu, where they found the hut burnt out, and amongst the debris they were able to discover the charred remains of three human beings.

'The golden bowl,' concludes Svarte Andreas, 'is still to be seen floating on the waters of the pool, which are even now tinged with the blood of the sacred deer; and maybe the beasts still get lost in the pitfall, but no Laplander or Norseman would care to lend a hand in taking them out.'

THE RED RAT'S DAUGHTER.

CHAPTER V.

IF Browne had ever looked forward to anything in his life, he certainly did to the dinner-party he was giving on the evening following his visit to the studio in Holland Park Road.

On more than one occasion he had entertained royalty at his house in Park Lane, and at various times he had invited London society to functions which, for magnificence and completeness of arrangement, had scarcely ever been equalled and never excelled. Upon none of these affairs, however, had he bestowed half so much care and attention as he did upon the dinner which it is now my duty to describe. Having written the formal invitation, he posted it himself; after which he drove to the restaurant which was to be honoured with Katherine Petrovitch's presence, and interviewed the proprietor in his own sanctum.

'Remember, Alphonse,' he said to that delightful little man, 'good as the others have been, this must be the very best dinner you have ever arranged for me. It must not be long, nor must it be in the least degree heavy; in addition to which every item upon the menu must be the best procurable. You know my taste in wine, and I give you *carte blanche* to ransack London for what you consider necessary in the way of rarities. Reserve "No. 6" for me, if it is not already engaged; and make it look as nice as you possibly can. I will send the flowers from my own house, and my own gardener shall arrange them.'

Alphonse chuckled and rubbed his hands. This was just the sort of order he delighted to receive.

'Ver' good; it shall be done, M'sieu Browne,' he said, bowing and spreading his hands apart in his customary fashion when pleased. 'I have

made you many, many dinners before, but I give you the word of Alphonse that this shall be the best of all. *Ma foi!* but I will give you a dinner zat for its betterment you cannot get in England. Ze cost I will'—

'Never mind the cost,' answered the reckless young man; 'provided you satisfy me, I don't think we're at all likely to quarrel about that. But, remember, it must be the best in every way. Nothing short of that will do.'

'I will satisfy you, m'sieu; never fear that. It is my honour. Perhaps it is royalty zat you have to come to my house?'

'It is nothing of the sort,' Browne replied scornfully. 'I am asking two ladies and one gentleman.'

Alphonse's face expressed his surprise. It looked as if he thought his beautiful dinner was likely to be wasted.

Having arranged the hour and certain other details, Browne returned to his cab once more, and drove off in search of Jimmy Foote. It was some time before he found him, and, when he did, a considerable period elapsed before he could obtain speech with him. Jimmy was at the Welter Club, playing black pool with two or three youths of his own type. From the manner in which their silver was changing hands, it certainly looked as if that accomplished young gentleman was finding his time very fully taken up, picking up half-crowns from the table, placing them in his pocket, and paying them out again.

'Hullo, Browne!' said Bellingham of the Guards, after the black ball had disappeared into the top pocket and while the marker was spotting it again. 'Are you coming in?'

'Not if I know it,' said Browne, shaking his head. 'Judging from the anxious expression upon Jimmy's face, things are getting a little too hot with you all.'

As Jimmy Foote remarked at a later date, this came pretty well from a man who that evening had ordered a dinner for four people which was destined to cost him upwards of fifty pounds. At the end of the next round, however, the former retired from the game, and, putting his arm through that of his friend, led him to the smoking-room on the other side of the hall.

'I hope you have calmed down, old fellow,' said Jimmy as they seated themselves near the fire. 'To what do I owe the honour of seeing you here to-night?'

'I want you to do me a favour,' Browne returned, a little nervously, for he was afraid of what Jimmy would say when he knew everything.

'Anything you like in the world, old man,' said the latter. 'You have only to ask. There is nothing wrong, I hope?'

'Nothing at all,' replied Browne. 'Rather the other way round, I fancy. The fact of the matter is, I have asked two ladies to dine with me to-morrow evening at Lallemand's, and to go

to the Opera afterwards. I want you to make one of the party.'

'The young lady is the painter of that charming Norwegian picture,' said Jimmy, with imperturbable gravity, 'and the other is her chaperon.'

'How on earth did you know it?' asked Browne, blushing like a schoolboy, for the simple reason that he thought his secret was discovered.

'It's very plain that you never knew I was a wizard,' returned his companion, with a laugh. 'You old duffer; try and put two and two together for yourself—that is to say, if you have any brains left to do it with. In the first place, did you not yesterday afternoon invite me to accompany you on a delightful yachting trip to the Mediterranean? You were tired of England, you said, and I gathered from your remarks that you were counting the hours until you said "good-bye" to her. We went for a walk, and as we passed up Waterloo Place I happened to show you a picture. You turned as white as a sheet at once, and immediately dived into the shop, bidding me wait outside. When you reappeared you acted the part of an amiable lunatic; talked a lot of bosh about preferring fogs to sunshine; and when I informed you you were on the high-road to an asylum, said it was better than that—you were going to the Holland Park Road. Our yachting cruise has been thrown to the winds; and now, to make up for it, you have the impudence to ask me to play gooseberry for you, and try to propitiate me with one of Lallemand's dinners, which invariably upset me for a week afterwards, and a dose of Wagner which will drive me crazy for a month.'

'How do you know I want you to play gooseberry?' asked Browne savagely. 'It's like your impudence to say such a thing.'

'How do I know anything?' said Jimmy, with delightful calmness. 'Why, by the exercise of my own common-sense, of course—a commodity you will never possess if you go on like this. You are spoons on this girl, I suppose, and since there's another coming with her, it's pretty plain to me somebody must be there to keep that other out of the way.'

'You grow very coarse,' retorted Browne, now thoroughly on his dignity.

'It's a coarse age, they say,' Foote replied. 'Don't I know by experience exactly what that second party will be like!'

'If you do you are very clever,' said Browne.

'One has to be very clever to keep pace with the times,' Jimmy replied. 'But, seriously, old man, if you want me, I shall be only too glad to come to your dinner; but, mind, I take no responsibility for what happens there. I am not going to be called to account by every London mother who possesses a marriageable daughter.'

'You needn't be afraid,' said Browne. 'I will absolve you from all responsibility. At any rate

you assure me that I can count upon your company?'

'Of course you can, and anything else you like besides,' Foote replied. Then, laying his hand upon Browne's shoulder, he added: 'My dear old Jack, in spite of our long acquaintance, I don't think you quite know me yet. I talk a lot of nonsense, I'm afraid; but as far as you are concerned you may depend the heart's in the right place. Now I come to think of it, I am not quite certain it would not be better for you to be decently married and out of harm's way. Of course, one doesn't like to see one's pals hurried off like that; but in your case it's different.'

'My dear fellow,' said Browne, 'as you said just now, you certainly do talk a lot of nonsense. Whoever said anything about marriage? Of course I'm not going to be married. I have never contemplated such a thing. It's always the way; directly a man shows a little extra courtesy to a woman, talks to her five minutes longer than he is accustomed to do, perhaps, or dances with her twice running, you immediately get the idea that everything is settled between them, and that all you have to do is to think about the wedding present you are going to give them.'

'When a man gives himself away as completely as you have done in this particular instance, it is not to be wondered that his friends think there is something in the air,' said Jimmy. 'However, you know your own business best. What time is the dinner?'

'Seven o'clock sharp,' said Browne. 'You had better meet me there a few minutes before. Don't forget we go to the Opera afterwards.'

'I am not likely to forget it,' said Jimmy, with a doleful face.

'Very well, good-bye until to-morrow evening.'

There was a little pause, and then Browne held out his hand.

'Thank you, Jimmy,' he said with a sincerity that was quite inconsistent with the apparent importance of the subject. 'I felt sure I could rely upon you.'

'Rely upon me always,' Jimmy replied. 'I don't think you'll find me wanting.'

With that Browne bade him good-bye, and went out into the street. He hailed a cab, and bade the man drive him to Park Lane.

Once it had started, he laid himself back on the cushions and gave free rein to his thoughts. Though he had impliedly denied it a few minutes before, there could be no doubt about it: he was in love—head over ears in love. He had had many passing fancies before, it is true, but never had he experienced such a strong attack of the fever as at present. As the cab passed along the crowded street he seemed to see that sweet face, with its dark eyes and hair; that slender figure, and those beautiful white hands, with their long tapering fingers; and to hear again the soft tones of her voice as she had

spoken to him in the studio that afternoon. She was a queen among women, he told himself, and was worthy to be loved as such. But if she were so beautiful and so desirable, would she have anything to do with himself? Could she ever be brought to love him? It was consistent with the man's character to be so humble, and yet it was strange that he should be so. Ever since he had been old enough to be eligible for matrimony he had been the especial prey of mothers with marriageable daughters. They had fawned upon him, had petted him, and in every way had endeavoured to effect his capture. Whether or not Katherine Petrovitch knew of his wealth it was impossible for him to say. He hoped she did not. It was his ambition in life to be loved, and be loved for himself alone. If she would trust him, he would devote his whole life to making her happy and to proving how well founded was the faith she had reposed in him. Vitally important as the question was, I believe he had never for one moment doubted her. His nature was too open and sunny for that, while she herself was of course above suspicion. The fact that she had confessed to him that her family was prohibited in Russia only served to intensify his admiration for her truthful qualities. Though he knew nothing of her history or antecedents, it never for one moment caused him any uneasiness. He loved her for herself, not, for her family. When he went to bed that night he dreamt of her, and when he rose in the morning he was, if possible, more in love than before. Fully occupied as his day usually was, on this occasion he found it more than difficult to pass the time. He counted the hours—nay, almost the minutes—until it should be necessary for him to set off to the restaurant. By the midday post a charming little note arrived, signed Katherine Petrovitch. Browne was in his study when it was brought to him, and it was with the greatest difficulty he could contain his impatience until the butler left the room. The instant he had done so, however, he tore open the envelope and drew out the contents. The writing was quaint and quite un-English, but its peculiarities only served to make it the more charming. It would give Madame Bernstein and the writer, it said, much pleasure to dine with him that evening. He read and re-read it, finding a fresh pleasure in it every time. It carried with it a faint scent which was as intoxicating as the fabled perfume of the Lotus Blossom.

Had the beautiful Miss Verney, who, it must be confessed, had more than once written him letters of the most confidential description, guessed for a single moment that he preferred the tiny sheet he carried in his coat-pocket to her own epistles, it is certain her feelings would have been painful in the extreme. The fact, however, remains that Browne had the letter, and, if I know anything of human nature, he has it still.

(To be continued.)

LYDDITE—THE NEW EXPLOSIVE.



THE recent achievement of the Sirdar, Lord Kitchener, in compassing the final destruction of Mahdism, is one which will live long in the memory of the British nation. No example could be found which better illustrates the famous saying of Von Moltke, that 'war is now an applied science ;' for the final rout at Omdurman, with all its examples of bravery and fighting skill, was only the culmination of a scientific campaign. The telegraph, the steamboat, and the railway were all utilised ; and without their aid Omdurman would have been an impossibility. Probably one of the most interesting features of the campaign, however, from a military standpoint, was the great success achieved by the lyddite shells, which, used for the first time in actual warfare by the British army, proved that lyddite is the best explosive as yet discovered for use in shells. It is the object of the present article to give a short description of this substance, which is destined to play an important part in the wars of the future. Lyddite, as has previously been stated in this *Journal* ('Modern Shells and Projectiles,' August 27, 1898), is only a variety of picric acid, which has been melted and allowed to solidify, thereby becoming denser.

Melinite, recently introduced into the French army, is also another form of picric acid ; indeed, most of the so-called 'new' explosives consist of this substance in one or other of its forms, disguised by different names. The history of picric acid as an explosive is remarkable, and furnishes a striking example of how great discoveries may frequently result from accident. Picric acid was discovered in 1771, and for more than a century was used as a dye for wool, silk, and leather, without its explosive powers being suspected. Some ten years ago, however, a fire occurred at a chemical-work in Manchester, and spread to a shed containing a quantity of this acid. Being melted by the heat, the acid flowed until it came into contact with a quantity of litharge stored in the same building. A terrific explosion followed, and subsequent investigation revealed the fact that under certain conditions picric acid behaved as a powerful explosive. Further experiments have made clear the necessary conditions ; and at the present time picric acid bids fair to outrival all other explosives for the purpose of filling shells.

Before proceeding to describe the manner in which this body is caused to liberate its explosive power, it will be advisable to give a brief account of its manufacture and common properties, in order that the sequence may be made clear. Pure phenol, or carboic acid (the common disinfectant obtained from coal-tar), is placed in a vessel with an equal amount of strong oil of vitriol (sulphuric acid), and the temperature raised to the boiling-

point of water. Strong nitric acid (aqua fortis) is then allowed to flow into the mixture, after which the whole is cooled, leaving a solid mass of yellow crystals in the vessel. These crystals are filtered and drained, and afterwards washed with cold water—when the residue is pure picric acid. The crystals so obtained have an intensely bitter taste, and for this reason have been largely employed on the Continent for the adulteration of beer. If handled, picric acid stains the fingers a golden yellow. If heated gently it melts quite tranquilly, and may be poured from one vessel to another. If strongly heated it chars with a slight fizz ; if hammered on an anvil no detonation occurs, as in the case of most other explosives. A cursory examination, such as the foregoing, gives no indication of its latent powers, and it is therefore a matter of little wonder that they should have remained undiscovered for more than a century.

To the uninitiated, such a body would appear to contradict all the ideas formed as to the properties of explosives. They are generally—and in the vast majority of cases rightly—regarded as substances extremely dangerous to handle, and which heat or a blow would cause to explode at once. The apparent discrepancy, however, may be easily reconciled if we consider the analogy furnished by a weight suspended by means of a string. Such a weight represents stored energy, ready to be liberated the moment the string is cut ; similarly, an explosive yields its energy immediately its stable condition is broken down. A sensitive explosive, easily called into action, such as nitro-glycerine, resembles a weight suspended by a thin thread, and therefore easily severed ; a stable explosive, whose constituents are not readily torn asunder, such as picric acid, resembles a weight held by a strong rope, and therefore more difficult to release. To set into action bodies of the latter type, it is necessary to provide a shock sufficient to break down the existing bonds, and thus set free the stored energy. We may pursue the analogy further : thus, a weak explosive contains little energy, and would be represented by a small weight ; a powerful explosive, on the other hand, would be represented by a large and heavy weight. We are thus enabled, by means of this simple analogy, to understand all the difference in behaviour exhibited by these bodies.

The shock necessary to explode picric acid in all its forms is furnished by a class of bodies known as 'detonators.' These are sensitive bodies which explode with great violence ; and if placed in contact with a large mass of picric acid, the shock to which their explosion gives rise causes the whole charge to detonate, an extremely small quantity of the detonator sufficing to set into action an indefinitely large quantity of the acid. Thus, by utilising a secondary substance to pro-

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vide the shock, this powerful explosive may be made to yield its latent energy. The best detonators for this purpose may be readily made from picric acid itself, by causing it to combine with the oxides of metals. Thus, with lead-oxide (litharge) it forms lead-picrate; with potash, picrate of potash; and so on. All these bodies explode on the slightest blow or application of heat, and are capable of producing the requisite shock to explode the main charge. In this we see the explanation of the Manchester explosion. In itself the acid would have been harmless; but, coming into contact with the litharge, lead-picrate was formed, which exploded and spread the chain of destruction to the whole mass of acid.

We are now in a position to understand the manufacture of lyddite shells, and the reasons for the precautions adopted. Picric acid made by the above process is melted by gently heating, and poured into the interior of the shell to the amount required; and on cooling becomes a solid, compact mass now known as lyddite. The inner lining of the shell is coated with clean tin, a precaution rendered necessary by experience and a knowledge of the properties of picric acid. It has been shown how this body combines with oxides to form picrates, which are able to bring about its detonation; and hence, if ordinary iron shells be used, any rust in the interior (which is oxide of iron) would thus tend to produce premature explosion, and render the shell unsafe to handle. The detonating charge consists of a small quantity of lead-picrate, which is placed in the shell immediately before firing, and which on impact produces a shock which brings the main charge into action.

According to the accounts received from those who participated in the recent Soudan campaign, the destructive power of the lyddite shells was enormous, and far exceeded any results previously attained. In an incredibly short time earth-works were destroyed, leaving breaches through which the shrapnel or man-killing shells could be fired, and the work of destruction thus completed. The experience of the whole campaign leaves no room for doubt that lyddite is by far the most efficient shell-explosive known.

It is a very difficult problem to ascertain the numerical superiority of lyddite over other explosives. It is certainly six times more powerful than nitro-glycerine, which in turn is at least eight times more powerful than the same weight of gunpowder. Further, all experience shows that its effects are spread over a much greater area than in the case of nitro-glycerine or dynamite, which are intensely local in their action. It has been frequently erroneously stated that lyddite or melinite may be used as a substitute for cordite or gunpowder in propelling a projectile; such could not be the case, however, as the explosion takes place so rapidly that the chamber of the gun would be inevitably shattered. Probably one of the greatest advantages of lyddite is its absolute safety to handle, which we can realise when we recall its use in the arts for over a century without its powers being even suspected. In this respect, combined with its superlative destructive capacities, lyddite approaches an ideal explosive for shells; and it is safe to predict that it will play an extremely important part in the great military operations of the future.

DR BARLOW'S SECRET.

CHAPTER IV.



THE climax of this somewhat curious series of events took place in the library, where Mr Hawthorne, Nellie, Dick, and Tompkins had been sitting for some time, awaiting the arrival of the culprit. There had already been a very animated discussion; for Nellie, with the charming inconsistency of her sex, had definitely taken up the cudgels on behalf of the erring Barlow, and insisted, in spite of the most convincing proofs to the contrary, that he would be able to clear himself of the charges brought against him. She was quite incapable of suggesting in what way he would accomplish this apparently impossible task, but she asserted again and again that he would do so to the ultimate confusion of those who had so cruelly misjudged him. She stood entirely alone in her conviction of his innocence, and had consequently been reduced to tears by the scepticism of the others,

who were troubled with no doubt as to his guilt.

Nellie's illogical attitude exasperated her father. He would not admit the possibility of Barlow explaining away proofs that would convict him in the eyes of any impartial jury. Indeed, the newly-appointed magistrate would have been considerably disconcerted if he had been suddenly assured of Barlow's innocence; for, even as it was, he was haunted by doubts as to the strict legality of his somewhat high-handed proceedings. He realised that he might be placed in a very awkward position if by some extraordinary combination of circumstances Barlow could ensure a verdict of not guilty. He felt sure that he would not be able to escape the ridicule of the local press and the smiles of his brother magistrates, even if Barlow, for Nellie's sake, agreed to look over what had passed. These reflections no doubt added to the vigour of his onslaught upon

Nellie's feeble efforts to exculpate her betrothed. Nothing would please those newspaper fellows better, he reflected, than to poke fun at what they called, in their horrible jargon, 'the great unpaid.'

Dick and Tompkins simply smiled pityingly at Nellie's arguments. That any intelligent jury would convict Barlow of various crimes and misdemeanours seemed, in their opinion, a foregone conclusion. That Mr Hawthorne, in having the culprit dragged ignominiously before him to be subjected to a private cross-examination, might be acting irregularly never entered their minds. Barlow, in their eyes, was a convicted swindler, and Mr Hawthorne was the omnipotent exponent of the laws which he had outraged. They devoted their energies to the discussion of more practical questions. Most of their time was spent in comparing Barlow's case with others of a similar nature, in order that they might determine exactly how long he was likely to be lodged and boarded at Her Majesty's expense, and whether he would have to mend roads, work on the treadmill, or pick oakum. Tompkins, smarting under the loss of his gold watch, was disposed to think that seven years' hard labour would be a very moderate punishment for so grave an offence; but Dick, not having suffered in person or pocket, was inclined to take a more merciful view of the case, and suggested that five years' penal servitude would amply meet the requirements of the case. Mr Hawthorne, when appealed to, pooh-poohed these suggestions as the vague surmises of the inexperienced amateur, but had himself the most nebulous ideas as to what would actually happen to Barlow when he was duly tried and convicted.

This interesting discussion was brought to a premature close by the sound of wheels on the drive, and a few moments later the door was thrown open, and Jones, the constable, ushered in.

'Well?' asked Hawthorne impatiently.

'We've got him, sir,' exclaimed Jones, his face glowing with triumph; 'but it was a close shave. The train was just startin', and we had to bundle him out head first. A precious hard fight we had of it, too. I shall charge him with assaultin' the police in the execution of their duty. Shall I bring him in, sir?'

'Certainly,' said Hawthorne. 'I should just like to hear what the scoundrel has the assurance to say for himself.'

As the constable disappeared Mr Hawthorne rose, leaned his back against the mantelpiece, parted his coat-tails, and assumed his most magisterial air.

'If he supposes for a moment,' said he, 'that by fawning and whining he'll wheedle me into letting him off he'll make a mistake, I assure you—he'll make a very great mistake indeed.'

'That's right, dad,' said Dick. 'You give it him hot and strong. He deserves it. I'd like to have a go at him myself!'

'If he's made away with my watch he needn't expect any mercy from me,' said Tompkins.

'Oh papa!' said Nellie in a quivering voice, 'don't be too—too hard on him. Perhaps, after all, he'll be able to explain everything.'

'Explain everything!' exclaimed her father. 'Pooh, pooh! Ridiculous!'

'Impossible!' cried Dick.

'Absurd!' echoed Tompkins.

'It's nothing whatever of the sort,' cried Nellie. 'I don't believe he's done anything wrong at all, and it's very cr—cr—cruel of you to talk like that until he's had a chance to prove his innocence. It's very cruel and wicked, and'——

'Hold your tongue this minute,' cried her father. 'I won't allow you to speak like that to me. If I hear another word from you I'll pack you off to your room instantly. Indeed, I think you'd better'——

He was interrupted by the opening of the door and the appearance of Barlow and the constable. It was difficult to recognise the spruce and rather dressy young doctor in the dishevelled being who stood before them. His silk hat was dinged and battered, his tie and collar awry, his coat torn, his whole person bearing the marks of a prolonged and vigorous struggle. For a moment he stood speechless with indignation. Hawthorne, believing that he was overcome with shame, cleared his throat with the intention of delivering a highly moral exhortation. But the constable interposed.

'It's my duty to warn you,' he said, addressing Barlow, 'that anything you say may be used against you as evidence.'

Barlow fairly stamped with anger.

'Will you hold your tongue, you hopeless idiot?' he exclaimed savagely. 'And you, Mr Hawthorne, will you be good enough to explain the meaning of this outrageous performance? I can only come to the conclusion that you have temporarily taken leave of your senses.'

This unforeseen attack from one he expected to pose as a cringing, shamefaced culprit, pleading abjectly for mercy, threw the worthy magistrate completely on his beam-ends. The moral platitudes he was about to utter died away on his lips, and he stood speechless and bewildered.

'Here, don't you try that game on,' interposed Dick; 'don't you bully the governor. I'll not stand it.'

As Hawthorne seemed for the moment inarticulate, Barlow turned promptly on Dick.

'You're a self-sufficient young ass, Dick,' he remarked, 'but you've got some glimmerings of intelligence. What's the meaning of all this?'

Dick was never slow to grasp at any chance of coming to the front.

'I'll soon let you know the meaning of it,' he rejoined promptly. 'You see, we happen to have discovered that on the 21st of June 1893 you married a woman of the name of Pettigrew at Highchurch.'

'Yes, sir. How do you explain that, sir?' blurted out Hawthorne. 'You, a married man, undertake to marry my daughter.'

Dick caught up the letter which lay on the table, and flourished it in Barlow's face.

'You get a letter from your wife in New York'—he exclaimed.

'And you bolt,' blustered his father once more, purple with indignation—'you bolt with my cheque for a hundred pounds.'

'And my gold watch and chain,' chimed in Tompkyns.

Barlow glanced from one to the other with an air of stupefaction, as if he could scarcely credit the evidence of his own senses.

'Well, upon my word and honour,' he exclaimed at length, 'if any of you gentlemen ever want a certificate to prove you suitable inmates for a lunatic asylum, I hope you'll save yourselves any further trouble by applying direct to me. There's your watch, Tompkyns.' He took it out of his waistcoat-pocket and laid it upon the table. 'If it were a pinchbeck Geneva it could hardly keep worse time. I took it out of your blazer for fear the servants should meddle with it, intending, of course, to return it when I saw you. If you were in your right mind I should expect you to take that for granted.'

He extracted a cheque from his pocket-book and laid it beside the watch.

'There, Mr Hawthorne, is your cheque for £100 still uncashed. I think that, before making up your mind that I was a swindler, you might at least have inquired at the bank whether I had cashed it. As to the letter, I shall inquire later on by what code of honour you consider yourselves justified in prying into my private correspondence; and, if I see fit to do so, I shall at the proper time and place give a full and satisfactory explanation. I may say, however, that I did go through a form of marriage with Mrs Pettigrew at Highchurch on the date named.'

'Oh, you did—did you?' blustered Hawthorne, recovering from his embarrassment at the sight of the uncashed cheque.

'That settles it,' said Dick.

'Oh Tom, Tom!' exclaimed poor Nellie.

Barlow held up his hand.

'Stop a minute,' he said; 'I can explain the whole thing to the satisfaction of any impartial man or woman.'

'Stuff and nonsense,' snorted Hawthorne.

'Well, you must think us jolly green,' said Dick.

'Just you wait a minute. She had every reason to believe herself a widow. Her husband, engaged on a scientific exploration on the west coast of Africa, was *officially* reported to be dead. After an absence of three years he turned up at the church door on the day of the wedding as we came out after the ceremony, and he and Mrs Pettigrew drove away in the carriage which I

had provided, and for which, I may mention incidentally, I had to pay. I will give you the address of the clergyman who performed the ceremony, and he will corroborate every word I have uttered. And now I am prepared to admit, Mr Hawthorne, that I should most certainly have told you about this. I see now that it was clearly my duty to do so; but the fact is, I was so chaffed and ridiculed at the time that I had grown morbidly sensitive about the business, and couldn't bring myself to speak of it. Indeed, it was in consequence of this affair that I left Highchurch and came here. I need hardly add that I am, of course, as much a bachelor as if Mrs Pettigrew and I had never set eyes on each other.'

'There, papa,' cried Nellie triumphantly, 'didn't I tell you he would explain everything?'

Mr Hawthorne flushed and began to look excessively uncomfortable. Dick wriggled uneasily in his chair, and even Tompkyns appeared embarrassed.

'But, my dear fellow, if all this is true,' stammered Hawthorne—'and if it is I owe you a most sincere apology—if all this is true, why in the name of common-sense did you run away?'

Something like a gleam of hope appeared in the eyes of Dick and Tompkyns. Barlow's sudden disappearance was certainly a suspicious circumstance, and perhaps, after all, his glib explanation of what had taken place was a false one.

'Run away!' exclaimed Barlow, with an air of mingled amazement and indignation. 'I did nothing whatever of the sort. A wealthy patient of mine, an old maiden lady, a morbidly nervous hypochondriac, is sailing to New York by the *Lucania*, and, having a horror of sea-sickness, telegraphed to me to accompany her. I was going to Liverpool, intending to sail with her as far as Queenstown, or even accompany her to New York if absolutely necessary. Just as the train was starting I was pounced on by a couple of idiotic policemen, and dragged forcibly out of the compartment. Of course she'll be annoyed at my absence, and I'll probably never pocket another fee from her again.'

Mr Hawthorne wiped the perspiration from his brow with a voluminous coloured handkerchief, conscious that he had placed himself in a very awkward situation, and wondering how he was to wriggle out of it. His eye fell on Dick, and he experienced an immediate sense of relief.

'Well, Dick,' he said severely, 'you see what a mess your groundless suspicions have got us into.'

Barlow promptly wheeled round on Dick, who looked very red and foolish.

'So Dick was at the bottom of it, was he?' said he. 'I'm not surprised to hear that. He's always putting his foot in it.'

Tompkins clutched eagerly at the chance of whitewashing himself at Dick's expense.

'I must confess,' said he, 'that Dick was the first to arouse my suspicions. Otherwise I should naturally have supposed that you had simply taken my blazer by mistake. You ought to be more careful about throwing suspicions upon innocent people, Dick.'

'I shall certainly never allow Dick to interfere with my affairs again,' said Nellie emphatically.

'I shall trust to my own judgment of a man in future,' said Hawthorne. 'I was just telling Dick that he ought to take a leaf out of your book, Barlow, and I hope he'll follow my advice.'

All eyes were fixed reproachfully on Dick, who visibly squirmed.

'Well,' he muttered to himself, 'if ever I try to help any one out of a hole again may I be jiggered.'

'Oh, well,' said Barlow, 'let's say no more about it. It can't be helped now, and I must confess that things looked a little queer. There's another train in half-an-hour, and perhaps I shall be in time after all. I can't go out in these things, but I dare say Dick can lend me some toggery.'

'Certainly,' said Dick effusively; 'I shall be delighted.'

'I'll lend you my watch and chain with pleasure,' said Tompkyns, 'if you've forgotten your own.'

'Oh, we'll fix you up, my dear fellow, never fear,' said Hawthorne, with unctuous affability; 'and I do hope you'll oblige me by putting that cheque back in your pocket-book.'

'You'll have some refreshment before you go, won't you, Tom?' asked Nellie. 'I'll tell the servants to get it ready.'

'Jones,' said Hawthorne to the constable, waving his hand in the direction of the door, 'you can go.'

'Oh, very well,' said Jones gloomily; 'but what about these 'ere charges of assaultin' the police in the hexecution of their duty?'

Barlow, who was a thoroughly good-natured fellow, and was beginning to see the humorous side of the situation, laughed jovially.

'Oh, well,' he said, 'I believe I gave you a pretty tough job of it before you got me out of the train. Here's a sovereign for you, and let us hear no more about it.'

'And here's another for your mate below,' said Hawthorne; 'but not a word of all this, remember, especially to the newspaper men.'

The constable grinned and saluted.

'Thank you, sir. I'll remember, sir.'

'Now, Tompkyns,' said Dick, 'where's your contribution?'

'Eh?' said Tompkyns. 'Well, I don't approve of tipping on principle; but I suppose, under the circumstances, I must make an exception.'

He produced a purse, and deliberately extracted a shilling, which he handed to Jones.

'There you are,' said he, 'but don't expect anything from me in future.'

Jones gazed contemptuously at the coin lying in the centre of his huge palm, and then put it slowly into his pocket.

'A bob,' he muttered as he moved ponderously to the door. 'Well, I'm blowed! A bob for assaultin' the police.'

A few minutes later, when Barlow and Nellie had slipped into the conservatory for a little private conversation, Nellie regarded him with a half-smiling, half-reproachful glance.

'Oh Tom, Tom!' she said, 'you told me you had never loved any one but me.'

'And I told you the truth, Nellie,' answered Barlow eagerly. 'My liking for Mrs Pettigrew was only a passing fancy.'

'Well,' said Nellie, 'I'm never going to doubt you, or be the least bit curious again; but, now that everything's come out, you won't mind showing me her photograph, will you?'

THE MONTH: SCIENCE AND ARTS.

THE STORAGE OF EGGS.



AN interesting experiment in egg storage was recently brought to a successful conclusion in the warehouse of Messrs Christianson of Bernard Street, Leith. In June a batch of 50,000 Scottish, Irish, and Danish eggs were sealed up in patent storage apparatus, and were opened and examined four months afterwards, only a small proportion of the eggs being found unfit for use. The secret of the method is to keep the eggs cool, to allow free access of air around each egg—to keep them upright in position, and to turn them periodically so that the yolk of the egg is constantly embedded in the albumen. These desiderata are

brought about by placing the eggs in frames, which by the action of a lever can be inclined in different directions as needed; in this way 23,000 eggs can be turned over in half-a-minute, without risk of breakage. Testimonials are at hand from reliable sources, showing that eggs so treated will remain perfectly fresh and good for at least five or six months.

SHIPS' BOATS.

In nearly every case of shipwreck—and unhappily we have had many of them of late years—it is common to read of the difficulty with which the boats are lowered; and it is no exaggeration to assert that if these boats were in readiness for instant use, and could be lowered into the water easily, hundreds of lives

would be saved. Any one who has made a coasting trip or crossed the Channel on an ordinary steam-vessel must have noted how the boats are disposed, carefully covered with tarpaulin, kept inboard, and with the appearance of not having been touched for months. It is easy to imagine how the only means of escape from a sinking vessel is vitiated by this state of unpreparedness. To quote two instances; there is first the wreck of the *Drummond Castle*, the inquiry into which elicited the information that 'the boats were not kept fit and ready for use, but swung inboard and resting on chocks;' and, second, there is the more recent case of the *Mohegan*, in which the same lamentable state of affairs seems to have obtained. We hold that on every ship there should not only be a boat-drill at least once a week, but that the boats should be kept supplied with tinned provisions and fresh water. With such precautions the terrors of shipwreck would be greatly diminished.

OCEAN TELEGRAPHY.

It is the proud boast of this country that it has laid and controls the major part of the electric cables which girdle the earth; and the masterful position thus created must be of incalculable importance in the event of war. It is, however, the fact that the cables are not so much used as a means of intercourse between friends and relations as they might be. Out of every hundred and ten messages passing between this country and Australia, one only is not devoted to purely business matters; and in the case of India the family message occurs only once in three hundred telegrams. The price of transmission—in some cases half-a-guinea a word—is the real bar to a more social use of the ocean cables. Mr Henniker Heaton, M.P., who has brought his imperial penny postage scheme to such a successful issue, has recently announced that his next great effort will be to establish perfect electrical communication between every part of the empire at a reasonable price. He looks forward to the time when any one in Britain will be able to wire to the antipodes almost as cheaply as one can between England and Scotland, and mentions a penny a word as a fair price to aim at. Whether at such a tariff it will be possible to pay a fair interest on the vast amount of capital invested in submarine cables, and whether it would pay to embark in fresh enterprises of the kind to meet the increase of work which might be expected, are questions which would have to be considered before such a radical change could be brought about.

ZULULAND.

According to the report of Mr J. J. Garrard, Acting Commissioner of Mines, the country of the Zulus, owing to its mineral riches, offers most favourable opportunities for the investment of capital. It has never been prospected, except in a

few isolated places, and even then in a very indifferent manner. Everything seems in favour of mining enterprise, for the geological indications promise valuable minerals, the climate is good, cheap labour is abundant, and there is easy access to a port. All these facts point to cheap supplies and mining at a minimum cost. 'What is wanted now,' says Mr Garrard, 'is the capital with which to make a fresh start in the right direction, the men capable of using that capital to the best advantage, and, lastly, the co-operation of the Government to encourage and foster what should prove to be the most important industry of this country for many years to come.'

MAGNETIC ROCKS.

Most persons will acknowledge that they retain in their memories the details of a fairy story learnt in childhood, while far more important things which occurred only a short time ago are forgotten. Hence when we read of that terrible shipwreck off the Manacle Rocks, Cornwall, which was brought about by the vessel being miles out of its right course, and see that the magnetism of the rocks is given as a possible initial cause of the disaster, the mind instantly reverts to the history of Sindbad the Sailor, where an incident of the same sort is vividly described. It is not by any means the first time that the influence of magnetic rocks has been gravely discussed; and about twenty-five years ago, when this question assumed an aggressive form, the matter was put to the test and finally set at rest under Government auspices. The then Astronomer-Royal at the Cape was provided with a small steamer and various instruments, and endeavoured, in coasting round different headlands, to detect their attractive power. This he failed to do, and the theory as to the attractive nature of rocks, so far as their alleged influence on ships is concerned, was proved to be a myth.

VENTILATION OF TUNNELS.

It seems certain that the passenger traffic of our large cities will in the near future be chiefly carried on by means of electric railways in underground tunnels, and many such works are now in progress. The experience gained in the use of steam locomotives for such service has shown that the problem of efficient ventilation—which resolves itself into a means of getting rid of the products of coal combustion—is one that seems incapable of solution. But the question has lately arisen whether, in case of accidental and protracted delay of a train in an electrically-worked tunnel-railway, the passengers would not be exposed to risk of suffocation. The fear seems altogether groundless, for the reason that these railways as now commonly constructed are constantly and most efficiently cleared of foul air. The carriages are shaped to the contour of the tunnel, with only a few inches to spare between their sides

and the wall, and they therefore sweep before them a huge mass of air, and suck after them as much more. In addition to this clearance there are enormous passenger-lifts at each station, which act as air-pumps. According to Sir Benjamin Baker, the designer of the latest of the Metropolitan electric railways, which is six miles in length, each passenger, even without the action of the lifts, will have at his disposal twenty times the quantity of air which would be provided, or be necessary, in a well-ordered hospital.

A MACHINE ROAD-MENDER.

In spite of the constant advance in mechanical contrivances there are certain occupations which must still depend upon handiwork. Such we assumed to be the business of picking up with the pickaxe the stones of a macadamised road before fresh metal could be laid and rolled upon it. But a machine called Rutty's Patent Macadam Road Scarifier may now be seen at work in London, and possibly elsewhere, tearing up the street roadway in the most satisfactory manner. It is of the nature of a plough, the ploughshare being represented by thick spikes of chilled iron, which, set at an angle, tear up the roadway as the machine is dragged behind a steam roller.

ELECTRICAL WONDERS.

Ignorance has of late years credited science with powers which are comparable only with those attributed to the genii of Arabian fairy tales. Whenever war shows its hideous face we are sure to hear of some daring chemist who professes to have invented a compound which will blow an invading host to pieces. Now it is the turn of the electrician, and we are gravely told that M. Tesla has discovered a means of annihilating an entire fleet. He has merely to switch on certain currents from a point far beyond the range of modern guns, and the ships and all that they contain will perish. A moment's consideration will show how idle such rumours are. Powerful as are the machines for the production of electricity, there is none known that will exhibit at one discharge a fraction of the energy let loose by a single flash of lightning. But even supposing that M. Tesla has discovered a rival to Jove's thunderbolts, are we to believe that the artificial is so much more potent in its effects than the natural article that it cannot be controlled by lightning-conductors?

CULTIVATED BLACKBERRIES.

Observant persons have noted that during the past year or two the wild bramble, or blackberry, has found a place in the fruiterers' shops and finds a ready sale. But it is not generally known that for years this common wayside berry has been successfully cultivated in various parts of England and Scotland. As the culture might with advantage be greatly extended and the matter

is of interest to fruit-growers and to the public generally, we give a few particulars as to the method pursued with great success by Mr Cadell at Larbert in Stirlingshire. Each bush is planted three feet from its fellows, and trained on wires which are fixed on posts six feet in height. Mr Cadell has two rows of bushes, each twenty yards in length, and running north and south, so that the sun can act equally on both sides of the rows. At first little manure is needed; but by the third year the plants will have reached maturity and can be treated more liberally. From the two rows of bushes described there was gathered in 1897 ninety-nine pounds of luscious berries, and as the weather last year was more favourable, the crop may no doubt have been greatly increased. The bramble has the merit of being a very hardy plant, and one which is free from the attack of insects and birds; moreover, its fruit remains in prime condition for a period of about two months—that is, during the whole of September and October. When the plant finds a congenial soil the berries are of large size and are not much inferior to the mulberry. Under cultivation and proper attention the tendency is, of course, in the direction of finer growth and improved flavour. Several of the many British sub-species of bramble repay culture. In America blackberries are extensively grown for their fruit; and of late years American kinds have with advantage been introduced into English gardens.

A VERY SANITARY HOUSE.

Japan has long rejoiced in earthquake-proof houses, and now we hear of an abode in Yokohama which possesses the unique distinction of being microbe-proof. It is said to have been erected by an eminent German bacteriologist, who hopes by its aid to avoid all the ills to which human flesh is heir so far as they are due to zymotic causes. The house is built of glass bricks, so that there is no need for windows, and the doors when closed are perfectly air-tight. Ventilation is brought about by air being forced into the building through cotton-wool filters, and in case this treatment does not rob it of all its bacteria, the air is further driven against glycerine-coated plates of glass. Of course when the door of this strange domicile is opened to admit visitors armies of air-borne microbes must come in too; but the sunlight which plays around the rooms will soon kill off these. We doubt whether this glass-case and cotton-wool treatment of human beings will bring any substantial advantage to the experimenters, and we should decidedly prefer a healthy, open-air life, microbes and all.

STEERING A BALLOON.

Many have been the attempts, by means of propellers and other contrivances, to render a balloon dirigible; and although on a very calm day the unwieldy thing has perhaps been coaxed

a point or two out of its course, little has been done to conquer its tendency to sail with the wind and in no other direction whatever. In his attempt to reach the North Pole by means of a balloon, Andrée had conceived the idea of trailing behind the car a heavy rope, the object of which was to retard progress, and thus have at disposal a surplus amount of wind which could be made to act upon a sail placed aslant, so as to alter the balloon's course towards the right or left at will. In order to test this theory, Mr P. Spencer, a well-known aéronaut, recently made a balloon journey over the flats of Essex, carrying with him a rope 500 feet in length, with a weight of 100 lb., together with a square sail of light material. It was found that the new equipment did what was expected of it, and that it was quite possible to avoid obstacles in the way of the trailing rope by manipulating the guy ropes attached to the sail. The trailing rope was also found to act as a splendid brake when the final descent was made, the car eventually touching the ground without the usual bump. The balloon was that which has been making captive ascents from the Earls Court Exhibition (London) for some months past.

TRICKS OF TRADE.

The art of adulteration has become, during these latter years, a scientific industry; and while the small retailer is fined for borrowing milk from 'the cow with the iron tail,' the cleverer, because better educated, purveyor of sophisticated wares too often gets off scot-free. A case in point has recently been brought under the notice of the Royal Agricultural Society, which shows to what impudent lengths an adulterator will go, and how difficult it is to bring him to book. Farmers are in the habit of steeping their seed wheat in a solution of sulphate of copper, otherwise known as blue vitriol, or bluestone, the cost of which is about twenty shillings per cwt. A compound called 'Finely ground vitriol, specially prepared as a dressing for wheat,' has been placed on the market at the price of twenty-eight shillings per cwt. On examination this was found to consist of sulphate of iron coloured with Prussian blue. Now, sulphate of iron is worth only four shillings per cwt.; but as it is commonly known as green vitriol, it cannot be said that the fancy compound of this salt and Prussian blue is sold under a wrong trade description. Luckily farmers have a simple and conclusive test ready to hand, for a solution of the genuine bluestone will quickly cover a knife-blade held in it with a coating of metallic copper.

LIFE IN THE DEEP SEA.

An expedition left London a short time ago, the object of which was to investigate a most important problem regarding the distribution of life in the sea. It used to be believed that the ocean depths were tenantless, and that all life

was confined to the shallow surface belt; but this idea had to be abandoned even before the *Challenger* went on her memorable voyage of scientific research. Next the idea was mooted that the oceanic fauna was confined to the surface and bottom belts, separated by an intermediate zone of barrenness. During the *Challenger* expedition it was found that if the depth at which the surface nets were towed was increased, new animals were enclosed in their meshes, an observation which pointed to the probability of life at all depths. The investigations now in progress are designed to settle this important point. The *Oceana*, fitted with deep-sea gear and every modern appliance, is at work off the west coast of Ireland. It was intended that extended observations should be made with a chain of tow nets, the length of which would be gradually increased until a depth of 2000 fathoms was reached. Experiments were also devised with nets of a self-opening and closing nature, so that samples of life at different depths could thus be secured. It was also intended to conduct experiments with a deep-sea trawl. The expedition was fitted out at the expense of the Royal Geographical Society and the Drapers' and Fishmongers' Companies.

CENTENARY EXHIBITION OF LITHOGRAPHS.

The beautiful art of drawing on and printing from stone was invented one hundred years ago by Senefelder. We are glad to note that the Committee of Council on Education have, on the initiative of the Society of Arts, determined to hold an exhibition at South Kensington Museum in honour of this event during the present winter. Lithography has been of immense service to mankind, and for certain work it still holds a premier position. In many respects the results it affords are far better artistically than those possible by the quicker, and therefore more convenient, processes which have partly superseded it. The exhibition cannot fail to excite widespread interest.

FORGOTTEN CHILDREN'S BOOKS.

In a previous number Mrs Molesworth sets down in pleasant and chatty fashion what she remembers of the children's books which charmed and instructed her own girlhood; and in the November part of this *Journal*, in the article, 'Writers for the Young,' the most popular names amongst the present-day authors were discussed. In his *Pages and Pictures from Forgotten Children's Books* (Leadenhall Press), Mr Andrew W. Tuer takes us much farther back, to the days of our great-grandmothers. These specimens are gleaned apparently from a period between 1788 and 1830, and comprise, besides Charles and Mary Lamb's anonymous *Poetry for Children* (which should have been so mentioned in the Preface), such veracious narratives as *A Present for a Little Boy*, *Trifles for*

Children, &c.; while we have Mr Anstey anticipated in the fish which holds the butt-end of the rod while the fisherman is dangling at the end of the hook, and the horse seated in a gig driving the groom. The paper and printing of Mr Tuer's volume must be much more sumptuous than his very numerous specimens, and his illustrations also have been improved in the reproduction and printing. The volume is interesting and instructive, as showing how much better off are the children of to-day in the matter of books for the young than their ancestors at the beginning of the century.

BREATHING AT HIGH ALTITUDES.

The experience of the doctor in charge of the men laying the now completed electric railway to the summit of the Gorner Grat in Switzerland (height, 10,289 feet above the sea) is that dwellers in the plains can never accustom themselves to physical exertion at great altitudes. According to a recent article in the *Revue Scientifique*, the workers, many of whom were from the low-lying province of Bologna, worked perfectly well in 1896, when the elevation was below 2400 feet; but in 1897, when they were getting above that height, the workmen began to complain of lassitude, bad headaches, loss of appetite, and other symptoms, which at first led the doctor to think an epidemic of influenza had broken out. None of the affected men could do anything like their usual amount of work; and though a short stay at Zermatt, in the valley below, banished the unpleasant symptoms, they returned as severely as before when the men resumed work on the mountain. The outcome of the observations was that the average man may be counted on to work up to a height of about 2900 feet; above 3300 his health and working power is seriously affected. In the end all the workmen from the plains had to be dismissed, and only mountain-born men engaged.

Experiments in breathing at high altitudes were discussed in this *Journal* in the number for the 6th of February 1897; and some references to mountain sickness occur in the article on the ascent of Aconcagua in the number for the 23d of last July.

THE IRISH GRANITE INDUSTRY.

There is far less known about the coloured or stained granites, with which the quarries of Galway literally teem, than there is about her marbles; but a granite industry is beginning to develop, with every prospect of a splendid future.

Mr Miller, of the Galway Marble Works, observing the beauty and abundance of these granites, got over workmen from Aberdeen some years ago to teach the local hands how to treat the stone, and these soon became adepts in the craft, and able to teach the new-comers. The quickness with which the Galway men master the details of the process is remarkable, and they are found to possess taste and no small amount of originality and capacity in designing. Four quarries lie close

to the town of Galway—those of Barna, Shantalla, Rahoon, and Bullagh. From Rahoon comes granite with stains of reddish tint and green cinctures, that of Shantalla is of a delicate mottled pink and green, and there are endless and beautiful varieties, all taking a very high polish which stands the effects of weather better than any marble, native or foreign, 'making this,' writes Mr M'Henry, one of the best geologists in Ireland, 'a peculiarly valuable stone, possessing two essentials, durability and beauty.' He also remarks on the close proximity of the vast and never-failing water-power of Lough Corrib, with all the facilities and advantages thus afforded for the works.

Hitherto no proper quarry has been opened, the stones being just removed when wanted from holes dug in the ground. Yet there is a good record of work done, and many beautiful and artistic products of it through the country. What will it be presently, when—according to a leading Scotch contractor, who, at the request of Colonel Courtenay, owner of the Shantalla quarry, has gone thoroughly into the matter—the works will be giving employment to at least 1000 men?

This is no idle speculation. Finding that Messrs Tapp & Jones, the great mineral surveyors, of Westminster, have more than confirmed previous reports, Colonel Courtenay has placed the whole business in their hands, and they are preparing plans for a regular quarry with a 'good face.' So the day may not be far distant when the clang of a great industry shall resound in one of the poorest districts in Ireland, and the City of the Tribes by the wild Atlantic, no longer desolate and forsaken, aloof from the stir and hum of the world's great business centres, shall take her place among them, self-helping and self-respecting.

DEATH AND SONG.

Oh, sing to me of my beloved dead,
That I may meet their lips in phantasy,
And clasp their hands, and hear them speak to me
In sweet, familiar greeting: they have fled
O'er viewless seas, and now may press and tread
In spirit form about my path and see
The fashion of my life, whate'er it be,
And kiss me when asleep upon my bed.

Thus let me feel their presence in sweet song
That shall close-knit me to their golden spheres,
And make my life more noble, and more strong
To wrestle with the short or lengthened years
That hold me from their bosoms, and prolong
My flowering joys and little budding cares.

CHARLES LUSTED.

* * TO CONTRIBUTORS.

- 1st. All communications should be addressed 'To the Editor, 339 High Street, Edinburgh.'
- 2d. For its return in case of ineligibility, postage-stamps should accompany every manuscript.
- 3d. To secure their safe return if ineligible, ALL MANUSCRIPTS, whether accompanied by a letter of advice or otherwise, should have the writer's Name and Address written upon them in FULL.
- 4th. Poetical contributions should invariably be accompanied by a stamped and directed envelope.

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